

seems probable that instead of being lowered the winter temperature in the British Isles would be raised in the long winter of the supposed glacial epoch. For the Gulf Stream flows at about four miles per day between the Azores and Norway—that is, about ten degrees of the earth's surface in six months, so that we may fairly suppose the midwinter heating of these countries to be dependent on the summer heating at about Lat. 40° – 45° . Now during the 166 days of the short summer in the epoch of great eccentricity, these latitudes received a greater daily average of heat than any latitude, even the equator, now receives in an equal time. Hence it is likely that the midwinter receipt of ocean heat in that epoch was much greater than at present. This seems to harmonise with the present condition of Mars. So far, indeed, as the evidence from the condition of Mars is admissible, it seems to be quite inconsistent with Croll's view.

A paper dealing more fully with the mathematical portion of the subject will shortly appear in the *Philosophical Magazine*, and a more exhaustive criticism of Croll's and Ball's works will be found in the January number of the *Geological Magazine* for 1895.

It is satisfactory to know that although the astronomical theory of the Ice Age has been steadily gaining an assured position among the semi-scientific public—one sees it referred to as the most generally accepted explanation in such diverse works as Nansen's "Journey across Greenland," and Laing's "Human Origins"—the rising school of geologists are strongly opposed to it, as contradicting the geological evidence.

EDWARD P. CULVERWELL.

NOTES.

THE President and Council of the Royal Society have this year awarded the medals as follows:—The Copley Medal to Dr. Edward Frankland, for his eminent services to theoretical and applied chemistry; the Rumford Medal to Prof. James Dewar, for his researches on the properties of matter at extremely low temperatures; the Davy Medal to Prof. Cleve, of Upsala, for his researches on the chemistry of the rare earths; and the Darwin Medal to Prof. Huxley, for his researches in comparative anatomy, and especially for his intimate association with Mr. Darwin in relation to the Origin of Species. The Royal Medals have been awarded to Prof. J. J. Thomson in recognition of his contributions to mathematical and experimental physics, especially to electrical theory; and to Prof. Victor Horsley for his important investigations relating to the physiology of the nervous system and of the thyroid gland, and to their applications to the treatment of disease. We learn as we go to press that the Queen has signified her approval of these awards.

THE following is a list of those who have been recommended by the President and Council of the Royal Society, for election into the Council for the year 1894–5, at the anniversary meeting on November 30:—President: Lord Kelvin. Treasurer: Sir John Evans, K.C.B. Secretaries: Prof. Michael Foster, Lord Rayleigh. Foreign Secretary: Sir Joseph Lister, Bart. Other members of the Council: Dr. Andrew Ainslie Common, William Crookes, Francis Darwin, Dr. Andrew Russell Forsyth, Sir Douglas Galton, K.C.B., Prof. Alexander Henry Green, Sir John Kirk, K.C.B., Prof. Horace Lamb, Prof. Edwin Ray Lankester, Prof. Alexander Macalister, Prof. John Henry Poynting, Prof. Arthur William Rücker, Osbert Salvin, Prof. J. S. Burdon Sanderson, Dr. Thomas Edward Thorpe, William Henry White, C.B.

WE regret to note the death of Prof. M. Duchartre, the eminent French botanist. He was in his eighty-fourth year.

THE Société nationale d'Horticulture de France is organising an international exhibition of horticultural products and industries, to be held in May 1895.

THE death is announced of Dr. Francesco Gasco, Professor of Comparative Anatomy and Embryology in the University of Rome.

SIR D. A. LANGE, who was appointed in 1858 the constructor of the Suez Canal, has just died, and was for some years director in England of that work. He was a Fellow of the Royal Geographical Society, the Society of Antiquaries, and of other learned societies, and the author of several important books connected with the Suez Canal.

A BLUE-BOOK has been issued containing Commissioner H. H. Johnston's report of the first three years' administration of the eastern portion of British Central Africa. The report deals with the physical geography of the country, its meteorology, agricultural conditions and resources, minerals, and fauna, with the characteristics of the native races, and is altogether of considerable scientific value.

AFTER the great earthquake shocks in Greece, last spring, a committee was appointed to make an examination of the Parthenon, in order to ascertain what damage the temple had sustained. The committee reported that the building had been seriously injured, and that there was great risk in allowing it to remain in its present dangerous condition. They recommended, therefore, that immediate steps be taken to strengthen it. Reuter's correspondent at Athens now reports that the Archaeological Society, at a meeting called to consider the question, have voted an unlimited credit for the purpose of effecting the necessary repairs.

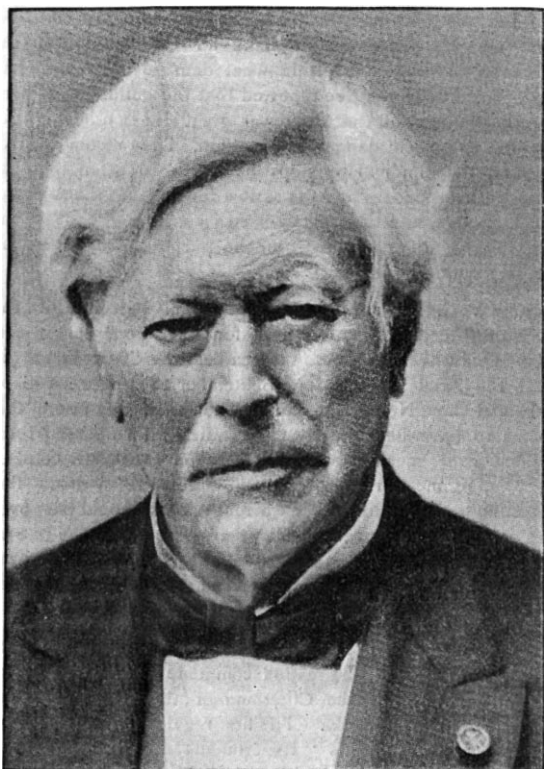
MR. H. C. RUSSELL, has sent us an account of the travels of three bottle-papers used for determining ocean currents. One was thrown into the sea near the Crozet Islands in March 1893, and was found in September 1894 between Cape Banks and Cape Northumberland. The mean daily rate of this appears to have been nearly eight miles. Two other papers travelled over much the same course on the south coast of Australia, at mean rates of six and nine miles a day. The interesting point is that three current papers should pass over more or less the same track, and agree so well as to the rate of the current. The paper that made only six miles a day was hampered with a heavy frame of wood, which had been put round it as a protection when it should reach the coast.

THE arrangements for the new session of the Society of Arts are now announced. The session commences on November 21 with an address from the Chairman of the Council, Major-General Sir John Donnelly. The first regular paper will be by Mr. Hiram Maxim, on his "Experiments in Aeronautics," and this will be followed the succeeding week by one by M. Hermite, on "The Electrical Treatment of Sewage." Two other papers—one by Mr. Thomas Ward on "Salt," and one by Gen. Michael on "Forestry"—will be read before Christmas. A number of papers for meetings after Christmas are also announced. Six courses of Cantor Lectures are promised, of which the first is by Prof. Vivian Lewes on "Explosives." There will be, as usual, a course of Juvenile Lectures after Christmas; the lecture this year is by Prof. C. V. Boys, F.R.S., his subject being "Waves and Ripples."

M. A. DELEBECQUE, of Thonon, sends us a small pamphlet on the lakes of Dauphiné. These lakes are very numerous, many of them being mere tarns or lagoons, and some, although figuring as sheets of water on the large-scale maps, are frequently dry. He gives an account of his soundings in the lakes of Bourget, Aiguebelette, Paladru, and the smaller lakes of the

plateau and mountain regions. As to the origin of these basins, M. Delebecque believes that many of the smaller are due to glacial action, either erosion or the irregular accumulation of moraine stuff. He does not confirm Forel's theory of the origin of the lake of Bourget by the barring of a lateral valley by the alluvium of the Rhone, but is inclined rather to look upon it as a result of movements in the crust. The origin of the other lakes is more obscure, but some appear to be probably due to movements of the strata, while others arose from the barring of lateral valleys by detritus. Particulars of temperature observations and analyses of the water of various lakes are given, and M. Delebecque concludes with an appeal to the local scientific societies of Dauphiné to initiate systematic observations on the lakes of the district.

MONSIEUR FAYE, the celebrated French astronomer, who lives in Paris, has recently received a handsome token of the admiration of his colleagues. All the members of the Bureau des Longitudes, together with their president,



Monsieur de la Grye, assembled in his house, and presented him with a silver enamelled tablet, on which Astronomy and History are represented offering a medallion to the most useful of careers. It bears the following inscription: "To Hervé Faye, President of the Bureau des Longitudes, 1874-1893. The homage of his colleagues." The two allegorical figures are sitting in the clouds, and Astronomy is pointing to the comet which was discovered by the illustrious astronomer. This interview greatly affected Monsieur Faye, who had only retired on account of the new law, opposing the perpetuity of the presidency.

MR. J. THEODORE BENT AND MRS. BENT leave London to-morrow, November 9, for an exploring journey in Arabia. They go first to Karachi, and thence by steamer to Muskat on the Gulf of Oman, where the land journey commences. It is

Mr. Bent's intention to cross Arabia from east to west, and, in doing so, to revisit the Hadramut Valley, and continue his archaeological researches there.

MR. TREVOR-BATTYE, to whose arrival at Archangel we referred last week, has telegraphed to the *Times* a detailed account of his experiences on his visit to Kolguef Island. He landed on the north-west coast of the island on June 21, at the mouth of the river Gosina, accompanied by Thomas Hyland (a bird-skinner) and a spaniel. A few days later they started to cross the island, and found the journey very difficult on account of the bogs and snow-filled ravines, and the severity of the weather, which was either cold and foggy or intensely hot, calling out swarms of mosquitoes. Birds were abundant, but the only mammal seen was a fox. At length, after a week's travelling, a party of Samoyedes and many reindeer were found near Chum. Mr. Trevor-Battye made this his headquarters until August 20, gaining much information as to the language and customs of his hosts, and assisting them in their hunting. He records the capture of 300 Brant geese in one net, and on another occasion the slaughtering of 300 reindeer. A Russian trader arrived who had visited the island for thirty-five successive years, and he remained a month transacting business with the Samoyedes. On September 18 Mr. Trevor-Battye sailed with the Russians for the mainland, and experienced bad weather on the way, and much difficulty in navigating the shallow water near shore. His orthodox companions attributed this difficulty to the presence of a Samoyede idol which was very displeasing to St. Nicholas; but Mr. Battye clung to his trophy, though at some personal risk. After landing, there was a four days' journey in sledges to Oksina, and a three days' boat trip up the Pechora to Ust Tsilma. It was the worst time of the year for travelling, as the land was marshy, and the rivers, unnavigable on account of floating ice, were not yet frozen over. However, Mr. Trevor-Battye and his companion struggled on in sledges or carts, and, after adventures with wolves and all manner of delays, ultimately reached Archangel in excellent health. Kolguef Island appeared to be of alluvial formation with no trace of massive rock, being possibly a remnant of the delta of a great river. The coast-line is quite different from that shown on the chart. Extensive zoological and botanical collections were secured.

At the annual meeting of the Royal Cornwall Geological Society, held at Penzance, on November 2, Mr. Howard Fox, the President, reviewed the progress made during the past twelve months towards the elucidation of the many unsolved problems of Cornish rocks. Mr. F. J. Stephens had found radiolarian cherts in the Meneage conglomerate, and on the mainland near Mullion. Mr. Ussher, of the Geological Survey, had traced Upper Devonian strata in the St. Germans district, west of the Tamar. The President himself had found similar strata west of Padstow, and a peculiar rock at Dinas Head in the same district, which contained nearly ten per cent. of soda. In its compact form it might easily be mistaken for a chert, but it passed into a nodular variety showing spherulitic structure. Whether it were a soda felsite (keratophyre) or a sedimentary rock altered by contact metamorphism, such as the Adinole of the Hartz, was a question on which petrologists were not as yet in absolute agreement. The evidence from sedimentary rocks in contact with greenstone on Cataclens and Round-hole Points indicated a sedimentary origin, as did General McMahon's notes on the sections he had examined. Crinoidal remains had been found in black shales of the Ordovician district of Veryan, interbedded with radiolarian cherts, but these shales had as yet yielded no typical zonal fauna. He (Mr. Fox) had sent some sections of the carboniferous cherts of East Cornwall

to Dr. Hinde, who found those from Carzantic Quarry, near Launceston, full of radiolarian casts, with one instance of structure. Further investigations were being made in this direction by Mr. Ussher and himself. In conclusion, he drew attention to the unwise practice of taking away shingle from beaches faster than it was being reproduced by nature.

IN connection with the controversy over preformation and epigenesis which at present agitates the biological world, we may draw the attention of our readers to a series of articles contributed by Wilhelm Haacke to the *Naturwissenschaftliche Wochenschrift* (Bd. ix. Nos. 32-38, Aug. and Sept. 1894), under the title "Schöpfung und Wesen der Organismenform." The writer passes under review the various theories of the origin and development of organisms which are associated with the names of Albrecht von Haller, Wolff, Blumenbach, Goethe, Lamarck, St. Hilaire, Darwin, Weismann, Roux and other biologists, and criticises them from a standpoint not far removed from that of Oscar Hertwig. The synthetic views of the author do not give one the impression of finality, but, as a historical *résumé* of the oscillations and tendencies of thought upon some fundamental problems in biology, Dr. Haacke's essay is distinctly interesting.

THE importance, both from economic and from scientific points of view, of a thorough knowledge of the floating fauna and flora round our coasts is so generally recognised, that our readers will be interested in a recent article which, in concise form, furnishes a number of valuable data upon this subject, and must considerably facilitate the further prosecution of similar researches. The article forms part of a report contributed by Mr. W. Garstang to the current number of the *Journal of the Marine Biological Association*, in which the author gives a record of his observations upon the fauna during 1893-94, and upon the breeding seasons of marine animals at Plymouth, and also submits an attempt to construct a calendar of the changes observable in the floating fauna from month to month in the same locality. *Der Anfang ist das Schwer*, and marine biologists familiar with the seeming fickleness of marine phenomena know well the powers of discrimination and the experience necessary for the production of accurately generalised information under this head. It is most satisfactory, therefore, that the valuable work upon our north-eastern fauna, which Prof. McIntosh has conducted for many years past at St. Andrews, should be now supplemented by the observations of another competent naturalist on our south-western shores. If, as we hope, arrangements can be before long be made for carrying on continuous observations at the young, but promising, station at Port Erin, and on the west coasts of Ireland and Scotland, we shall in good time be equipped with data of the most valuable kind for determining many problems connected with the natural history of our migratory and other fishes.

THE second of the *Tufts College Studies* embodies the results of an investigation of the development of the lungs of Spiders (*Agelena novia* and *Theridium tepidariorum*) by Orville L. Simmons. The author's interpretations differ entirely from those of Jaworowski, already noticed in our columns (October 25, p. 621). He finds that the lungs arise as infoldings of the posterior surface of the appendages of the second abdominal somite, the lung cavity being essentially a pit in the body-wall at the base of, and behind, the appendages in question. The development of the lamellæ agrees strikingly with Kingsley's observations on the origin of the gills of *Limulus*, and lends considerable support to Prof. Lankester's well-known theory. The tracheæ develop behind the next pair of limbs at the apex of a similar depression of the body-wall. In their earlier stages these appendages show on their posterior surfaces certain feeble undulations, which the author regards as aborted

lung- or gill-lamellæ. The tracheal twigs arise as simple ingrowths comparable, in the author's opinion, with the infoldings which produce the lamellæ. Mr. Simmons concludes that the lung-book condition is primitive, the tracheæ of Arachnids being derived from it. How far he is right in this conclusion, and how far (if at all) Jaworowski has gone wrong, are questions that we hope will not long remain undecided.

A REDETERMINATION of the temperature of greatest density of water has recently been carried out by M. de Coppet, who gives an account of his results in the *Annales de Chimie et de Physique*. On account of the very slow change of density about that temperature it is difficult to determine it within a hundredth of a degree Centigrade. The method adopted was a modification of that of Despretz. A number of thermometers were mounted in the lid of a cylindrical water vessel with their bulbs at various distances from the bottom, and symmetrically disposed about the axis. On immersing the vessel in a cold water bath, a current was set up, passing down along the sides and ascending in the centre. After a while the current stopped, and then was reversed. The course of the current could be followed by the readings of the thermometers. The water having the greatest density would sink to the bottom, and the temperature of the lowest bulb would be approximately that of greatest density. But the temperature at which the lowest thermometer stopped for a time was higher on cooling than on heating. The curves exhibiting the two series of changes are, however, symmetrical, and give the temperature of maximum density as 3°·982 by the hydrogen thermometer under a pressure of one atmosphere.

A SIMPLE method of obtaining light of different wave-lengths for use in polarimetric work is described by Landolt in the *Sitzungsberichte* of the Berlin Academy, No. 38. White light from an Auer's glow-lamp is passed through different absorption cells containing coloured solutions which can be readily procured. Details are given of the preparation of five such cells, by means of which red, yellow, green, light blue, and dark blue light may be obtained. Examined spectroscopically, the light is in each case found to consist of a band, and is not by any means monochromatic; if, however, the rotation be less than 20°, or, with one or two of the cells, even if it be considerably greater, the field of the polarimeter remains apparently uniform in tint. The wave-lengths with which the bands may be taken to correspond, were determined by using the cells in a set of observations on the rotation of quartz, and comparing the results with those obtained for the rotation of quartz by Broch's method. The wave-lengths were thus ascertained to be not far removed from those of the Fraunhofer lines C, D, E, F, G. The instrument employed was a Laurent half-shadow polarimeter fitted with a Lippich's polariser. A simple method of this kind has long been required for the speedy investigation of rotatory dispersion. It is also of importance to have a ready means of obtaining light of short wave-length, which is of especial service when determining the rotatory power of feebly active substances.

IN a paper communicated to *L'Electricien* (Paris), M. G. Darriens gives an account of some recent experiments he has made on the chemical reactions which take place in the ordinary lead accumulator. To get an idea of the chemical state of the negative plate of an accumulator, the author treated a given weight of the negative plate of a fully-charged accumulator with hydrochloric acid, and measured the volume of hydrogen evolved. He then measured the volume of hydrogen evolved when an equal weight of ordinary sheet-lead was dissolved in hydrochloric acid, and obtained practically the same number as before. This experiment seemed to indicate that the negative plate of a charged accumulator consists of metallic

lead, in a very finely-divided state, and that a charged accumulator simply represents an ordinary voltaic cell in which lead is the negative element. In order to test this point, the author has examined the behaviour of several forms of primary battery in which finely-divided lead is used as the negative metal. In the case of a Daniell cell consisting of a copper plate in a saturated solution of copper sulphate and a plate of spongy lead in dilute sulphuric acid, the liquids being separated by an ordinary porous pot, the mean of several experiments gave the value 0.64 volt as the electromotive force. A calculation of the electromotive force of this cell, based on the heats of formation of the different substances, gives 0.3 volt, so that it would appear as if lead in this very finely-divided state evolved more heat when it entered into combination than under ordinary conditions. If this supposition is true, it is necessary to add 0.34 to the figures calculated for ordinary sheet-lead, to allow for this "allotropic" modification of the metal. If we apply this correction to the observed electromotive force (1.6 volts) of an element consisting of PbO_2 and pure lead, we get the quantity 1.94 volts, which represents the electromotive force of the element PbO_2 and spongy lead. The above values can be utilised to calculate the quantity of heat necessary to convert ordinary lead into spongy lead, the value obtained being 7.4 calories. With a Daniell cell, as described above, in which the spongy lead had a surface of one square decimetre, and weighed 440 grms., the mean electromotive force was 0.57 volts and the capacity 13.75 ampere-hours, the internal resistance being about 0.12 ohms. This form of cell is subject to the same objection as the ordinary form of Daniell, namely, that after a time the copper-sulphate solution diffuses through the porous pot, and the copper is deposited on the negative metal.

THE filtration of water on a large as well as on a small scale has acquired quite a different significance since the bacteriology of water has sprung into existence; and it is as a useful, because impartial contribution to this subject, that we welcome Surgeon-Major Johnston's short treatise on "the relative efficiency of certain filters for removing micro organisms from water." The investigations here recorded were made as qualifying work for the degree of D.Sc. at Edinburgh University, and the experiments were carried out in the Public Health Laboratory of the University. The filters examined were those known as the Atkins patent water filter, Maignen's table "Filtre Rapide," the Nordmeyer-Berkefeld filter, and the Pasteur-Chamberland filter. The first two filters are described as useless for sterilising water, both of them not only allowing "micro-organisms to pass through the pores," but affording "a suitable nidus for the growth and multiplication of micro-organisms, which are found in much greater numbers in the filtered water than in the unfiltered." The "Berkefeld" and "Chamberland" filters were more elaborately examined. The "Chamberland" cylinder selected was one intended for slow filtration, and in comparing the results obtained with it and the "Berkefeld" cylinder respectively, it must be borne in mind that the rate of filtration through the latter was $5\frac{1}{2}$ times greater than through the former, although after twenty-four hours' continuous filtration, the rate was only $1\frac{1}{2}$ times greater. Major Johnston's opinion, based on his examination of these particular cylinders, is that "the Pasteur-Chamberland filter is the best and only one on which reliance can be placed for permanently sterilising water." An important point, and one which has been overlooked by the author, is the temperature of the room in which the filters were kept whilst under examination. Freudenreich found that a higher or lower temperature had a marked effect on the efficiency of the Chamberland filter. It is to be regretted that in a thesis of this kind, purporting to have a bibliography, the author should have entirely neglected to mention or refer to, in any

way, a large number of important investigations on these particular filters published during the last few years in various foreign journals.

MR. G. J. SYMONS has contributed to part ii. of the Report of the Chicago Meteorological Congress, an interesting summary of early English meteorological literature, embracing the years 1337-1699. He only deals with some fifty books and pamphlets contained in his own library, but his special knowledge of meteorological bibliography enables him to give some useful particulars about these old works. We can only briefly refer to a few of them here. In the Bodleian Library at Oxford there is (as far as is known) the earliest continuous weather record in the world, containing observations by the Rev. W. Merle from January 1337 to January 1344. A few copies of a translation of this work were printed in 1891. These observations show that the weather at that time was very similar to what it is now. In 1670, "The Sheppard's Legacy" was printed. This work is excessively scarce, and is the earliest edition of what has since been reprinted many times as "The Shepherd of Banbury's Rules for judging the weather." In 1671 appeared "A discourse concerning the Origine and Properties of Wind," &c. This treatise is noteworthy as being probably the first in which the theories of the winds are compared with details of the trade winds, monsoons, &c. In 1696 a work entitled "New Observations on the Natural History of the World of Matter," &c., by the Rev. T. Robinson, was published. It gives the earliest description yet known of the strong local wind known in Cumberland as the *helm wind*. The subject of this wind has been brought before the Royal Meteorological Society on several recent occasions, and that Society appointed a committee to collect information upon it.

THE November number of the *Journal* of the Chemical Society has been published. It is almost entirely taken up with abstracts of papers published in other journals.

MESSRS. R. FRIEDLÄNDER AND SON have sent us their *Natura Novitates*, Nos. 14-19, 1894, and No. xxx. of the quarterly list of their new publications. The lists are invaluable to those who wish to keep in touch with recent scientific literature.

THE *Quarterly Journal* (No. 201) of the Geological Society contains several papers on the geology of Africa. Dr. J. W. Gregory describes the glacial geology of Mount Kenya; Captain H. G. Lyons, the stratigraphy and physiography of the Libyan Desert; and Mr. H. Draper, the principal physical and geological features of South-eastern Africa, and the occurrence of dolomite in South Africa. There are seven other papers in the *Journal*, and sixteen plates.

WE have received parts iv. to vii. of the third volume of the *Transactions* of the Leicester Literary and Philosophical Society, extending from July 1893 to July 1894. The Society holds general meetings, at which lectures of a more or less popular character are given, and sectional meetings for the reading and discussion of technical papers. Its object is to cultivate literature, science and art, and, judging from the reports, good work is being done in each of these directions.

It is well known that Dr. A. Bernthsen's "Text-book of Organic Chemistry" is an excellent elementary account of the principles of organic chemistry. Dr. George McGowan's translation of the work, published by Messrs. Blackie and Son, was reviewed in these columns in December 1889 (vol. xli. p. 172). A second English edition, revised and extended by the author and the translator, has now appeared. It is virtually a translation of the fourth German edition, published last year, and therefore various chapters have been recast in order to include new developments of their subjects.

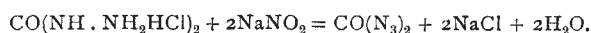
MESSRS. R. AND J. BECK have just issued an illustrated catalogue of microscopes, object-glasses, and other apparatus for which they are famed. In it we find descriptions of microscopes, from the large binoculars (which some investigators declare to be almost indispensable for certain researches) to the smaller instruments suitable for bacteriological and clinical work, and the useful petrological microscopes. The microscope, like the telescope of the present day, bristles with innumerable accessories, and Messrs. Beck's catalogue appears to contain most of these adjuncts. A copy of the catalogue will be sent, post free, on application.

THE Report of the Weather Bureau of the United States for the year 1893, which has just reached this country, shows that a general reorganisation has been effected, and that the work has been carried on successfully. A very important publication of the results of observations during 1891 and 1892, from upwards of 2000 stations, has been recently issued. Every means is taken to popularise the science; the daily weather map is now issued at seventy-two stations of the Weather Bureau outside of Washington, the number distributed annually being over two and a half millions. The circulation of the weekly weather crop bulletins of the State services has also greatly increased; and continues to be the most valuable feature of State weather service work. A large number of railway companies co-operate with the Bureau in distributing the daily weather forecasts by telegraph over their lines, and whistle-signals are used to a considerable extent in some States. The subject of seasonal forecasts is receiving the careful attention of the Bureau, since the meteorological service of India has indicated a path by which useful results can perhaps be reached. The report also states that Prof. Bigelow continues his studies of magnetism with sufficient prospect of success to justify the time and labour expended. The library of the Bureau now consists of nearly 20,000 books and pamphlets, and the bibliography of meteorology comprises more than 65,000 titles.

CULTIVATORS and admirers of roses will be interested in "Rhodologia"—a discourse on roses and the odour of rose—by Mr. J. C. Sawyer, published by W. J. Smith, North Street, Brighton. Too much attention is generally given to the development of colour, form, and size of the flower, little heed being paid to the great variety of perfumes generated in the beautiful petals. Mr. Sawyer says that there are experienced gardeners who can discriminate many varieties of roses in the dark, recognising them by their perfumes. The pure odour of rose is best represented by *Rosa Damascena*, Miller, and *R. centifolia*, Lin. The art of distilling roses appears to have originated in Persia, and dates from about 1612. In 1684 it is certain that otto of rose was manufactured on a large scale at Shiraz. Otto of rose was known in Europe, however, about forty years sooner than in the East, where its manufacture was first practised. We learn that at the present day the odorous products of the rose are extracted in Bulgaria, France, Germany, and to some extent in India, Persia, Tunis, Algeria, Morocco, and Egypt. The rose cultivated in Bulgaria for the otto is a variety of *R. Damascena*—the red damask rose. *R. centifolia*, which in English gardens is grown as the cabbage rose or Provence rose, is cultivated commercially in the south of France. Mr. Sawyer brings together in his pamphlet a mass of details of interest to students, as well as to manufacturing chemists and buyers of rose-products. Rose growers (both amateur and professional) should certainly read "Rhodologia."

Two remarkable substances, carbazide or carbonyl nitride, CON_6 , the nitrogen analogue of phosgene gas COCl_2 , and di-urea, $\text{CO}(\text{NH} \cdot \text{NH})_2\text{CO}$, the carbonyl derivative of di-

hydrazine, are described by Prof. Curtius and Herr Heidenreich in the current *Berichte*. The former compound, which is constitutionally formulated $\text{CO}(\text{N}_3)_2$, is found to be readily produced when the recently described hydrochloride of carbonylhydrazide, $\text{CO}(\text{NH} \cdot \text{NH}_2\text{HCl})_2$, is treated with a cold aqueous solution of sodium nitrite. The reaction is a relatively simple one, proceeding according to the equation:—

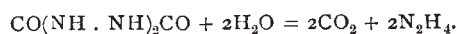


Carbazide as thus produced is a colourless oil of most explosive character. It explodes with great violence when merely touched. When the oil is dissolved in ether, and the solution is allowed to evaporate over calcium chloride, the pure substance CON_6 is left in long brittle crystals, which usually explode spontaneously in a bright light, but may occasionally be preserved for some little time before disruption. The substance is extremely volatile, and the vapour possesses a most penetrating and stupefying odour, reminding one simultaneously of phosgene gas and azoimide, N_3H . Its composition is readily proved by saponification with alkalis, which convert it into salts of azoimide, which can be precipitated by silver nitrite. It also reacts with aniline in alcoholic solution to produce carbanilide and free azoimide. The second compound described in the

communication, di-urea, $\text{CO} \begin{array}{c} \text{NH} \cdot \text{NH} \\ \text{NH} \cdot \text{NH} \end{array} \text{CO}$, is produced when

the compound $\begin{array}{c} \text{NH} \cdot \text{COOC}_2\text{H}_5 \\ \text{NH} \cdot \text{COOC}_2\text{H}_5 \end{array}$, also recently described by

Prof. Curtius, is heated to 100° in a tube with hydrazine hydrate. Di-urea crystallises readily from water in monoclinic prisms melting at 270° . It behaves as a strong monobasic acid which is capable of expelling carbonic acid from carbonates. The ammonium salt, $\text{C}_2\text{H}_3\text{N}_4\text{O}_2 \cdot \text{NH}_4 + \text{H}_2\text{O}$; barium salt, $(\text{C}_2\text{H}_3\text{N}_4\text{O}_2)_2\text{Ba} + 3\text{H}_2\text{O}$; silver salt, $\text{C}_2\text{H}_3\text{N}_4\text{O}_2\text{Ag}$; and diammonium (hydrazine) salt, $\text{C}_2\text{H}_3\text{N}_4\text{O}_2 \cdot \text{N}_2\text{H}_6$, have been prepared and analysed. It is a very stable substance, quite different in this respect from the explosive carbazide above described. When heated, however, with concentrated hydrochloric acid in a sealed tube to 150° it is decomposed into carbonic acid and hydrazine.



The hydrazine remains combined with the hydrochloric acid in the form of a chloride, presumably diammonium chloride $\text{N}_2\text{H}_5\text{Cl}$.

THE additions to the Zoological Society's Gardens during the past week include a Brown Capuchin (*Cebus fatuellus*) from Guiana, presented by Mr. Graham S. Pownall; two Common Marmosets (*Hapale jacchus*) from South-east Brazil, presented by Mr. D. B. Macdougall; two Black-backed Jackals (*Canis mesomelas*) from South Africa, presented by Mr. Claude Southey; three Crossbills (*Loxia curvirostra*), two Parrot Crossbills (*Loxia pityopsittacus*), an European White-winged Crossbill (*Loxia bifasciatus*), a Yellow Bunting (*Emberiza aureola*), two Northern Marsh Tits (*Parus borealis*) from Russia, presented by Captain A. Newnham; a Double-ringed Dove (*Turtur bitorquatus*) from Java, presented by the Hon. Rose Hubbard; a Black Salamander (*Salamandra atra*), European, presented by Mr. Maurice Suckling; a Bonnet Monkey (*Macacus sinicus*) from India, two Lions (*Felis leo*, ♂ & ♀) from Africa, deposited; a Golden Plover (*Charadrius phivialis*), three Dunlins (*Tringa alpina*), European, purchased; a Spotted Pigeon (*Columba maculosa*), a Triangular-spotted Pigeon (*Columba guinea*), two Vinaceous Turtle Doves (*Turtur vinaceus*), bred in the Gardens.